

Computer Science

Introduction

In the new millennium and the global era, the role of information and automation in the various domains and activities of the business industry are becoming more important. The successes of the activities are determined by its information system. Information must be up-to-date, accurate and comprehensive to allow decision makers to determine the enterprise's strategy. Furthermore, automation can facilitate human activity, accelerate the pace of work and make it more effective and efficient, while also increasing productivity in various activities. The development of communication and computer technology has made it possible to get information that is rapid, exact, and accurate, while increasing the application of automation in various fields such as Industry, business, office affairs and in the development of science and technology.

The Computer Science study program was founded in September 1987, under STMIK BINA NUSANTARA; it became one of the programs under the coordination of the Faculty of Computer Science, BINA NUSANTARA UNIVERSITY in December 1998.

The study of computer science at BINA NUSANTARA UNIVERSITY puts emphasis on the process, techniques, and tools that go into developing computer based systems, with specialities in object oriented software engineering, multimedia, web, database and computer network orientation.

Vision

A study program of choice in Computer Science which focuses on developing creative software solutions for industry, is recognized internationally, champions innovation and delivers graduates with international qualification.

Mission

The mission of Computer Science Department is to contribute to the global community through the provision of world-class education by :

1. Educating students with fundamental and advance knowledge, skill and practice in software development specialized in database technology, intelligence system, networking or multimedia and game development by providing an excellent learning environment and promoting research and collaboration with global industry.
2. Providing IT professional services with emphasis in application of knowledge in terms of society development.
3. Sharing application of knowledge related to computer science for Indonesian and international community quality of life improvement.
4. Promoting students & lecturers to be creative and value-addings talents in computer science by creating suitable environment in order to be able to compete in international level.
5. Preparing students for becoming smart and good ICT professionals, leaders and entrepreneurs in global market or for continuing in advanced studies.

Program Objective

The objectives of the program are :

1. To provide students with a solid foundation of mathematical, algorithm principles, computer science knowledge and ethical that will be needed in IT practice.

2. To provide students with skills to apply design and development principles in the construction of software system applied in database technology, intelligence system, networking and multimedia development.
3. To prepare students with abilities to keep up-to-date with the latest Information Technology trends, developments and industries.
4. To prepare students with abilities in problem solving and good communication skills to be able to work as an individual or in a team in an IT environment.

Graduate Competency

At the end of the program, graduates will be able to :

1. Apply knowledge and understanding of mathematical concepts, principles and theories relating to computer science knowledge.
2. Demonstrate knowledge and understanding of algorithm concepts, principles and theories relating to computer science knowledge.
3. Classify problems and to apply design and development principles for specific problems.
4. Classify criteria and specifications appropriate to specific problems, plan strategies for their solution and construct software system development.
5. Construct a solution by applying current technologies.
6. Depict trend technologies in the future.

Prospective Career of the Graduates

After finishing the program, the graduate of Computer Science Study Program could follow a career as:

1. Software Engineer/Developer
2. System Analyst/Developer
3. Web Engineer/Developer
4. Computer Network Specialist
5. Database Specialist
6. IT Support/Consultant
7. Multimedia Programmer
8. Lecturer/Trainer

Curriculum

The present curriculum used in the Computer Science study program has been developed in line with the National Curriculum. Also, the local content has been developed in line with the Computer Science Curriculum standard of ACM (Association for Computing Machineries), several local and foreign universities, and market trends, so that the graduates of the Computer Science study program are expected to be able to face competition at both a national and international level.

Generally, the subjects of the curriculum 2014 are divided into these following groups of subjects:

Mathematics Group (Science)

The objective of this group is to provide an understanding of mathematics as one of the principal foundations in computer science. Another objective is to give an understanding of scientific methodology (data collection, hypothesis, research, analysis) in problem solving.

Character Building Group (Professional Practices)

The objective of this group is to develop the personal strengths of the student and to provide him or her with a professional character, professionalism in their field, management skills, oral and written communication skills, understanding of business ethic, ability to work as a team, and to develop a “Binusian” Character.

Core Group

The objective of this group is to provide a grounding in Computer Science through practice as well as applied theory which are required by business both now and in the future. The subjects that are included in this group are programming, algorithm design and analysis, software engineering, databases, computer graphs, multimedia, computer and human interaction, operation system, computer architecture, and computer network.

Concentration Subject (Stream)

The objective of this group is to give students the opportunity to obtain a deep understanding of a range of disciplines in computer science. The students are expected to develop their skills and master the techniques which will allow them to conduct research for both their thesis and/or to continue their studies.

The Concentration subjects (Stream) provide:

1. Software Engineering: to explore the various methodologies and software engineering equipment.
2. Intelligence Systems: to explore the various techniques of computer intelligence that can be applied for problem solving.
3. Database Technology: to explore the various technologies and Database Application.
4. Networking: to explore computer networking which consists of installation, administration, and computer networking management.
5. Applied Networking (CISCO): to explore computer networking technology based on computer network equipment (CISCO equipment).
6. Interactive Multimedia : to explore computer interactive multimedia applications, based on computer programming, design tools, and software engine.
7. Applied Database : to explore computer specialized technology for database application development based on Oracle product.

Entrepreneur and Employability Skill (Internship)

The objective of this group of subject is to prepare students with professional experience, work ethics and to experience working environment. The students are expected to apply and to practice their knowledge in the real working area such as industry, research lab, and also as entrepreneur start up. And give reports as the result of the subjects.

Course Structure

Sem	Code	Course Name	SCU	Total	
1	CHAR6013	Character Building: Pancasila	2	20	
	MATH6025	Discrete Mathematics	4		
	COMP6060	Programming Language Concepts	2		
	COMP6047	Algorithm and Programming	4/2		
	MATH6031	Calculus	4		
	English University Courses I				
	ENGL6128	English in Focus	2		
	ENGL6130	English for Business Presentation	2		
2	CHAR6014	Character Building: Kewarganegaraan	2	20	
	COMP6048	Data Structures	4/2		
	MATH6030	Linear Algebra	2		
	COMP6056	Program Design Methods	4		
	COMP6175	Object Oriented Programming	2/2		
	English University Courses II				
	ENGL6129	English Savvy	2		
	ENGL6131	English for Written Business Communication	2		
3	COMP6049	Algorithm Design and Analysis	4	22	
	ISYS6169	Database Systems	4/2		
	CPEN6098	Computer Networks	2/2		
	COMP6065	Artificial Intelligence	4		
	ENTR6003	Entrepreneurship I	2		
	CHAR6015	Character Building: Agama	2		

Sem	Code	Course Name	SCU	Total	
4	STAT6021	Research Methodology	2	23	
	COMP6100	Software Engineering*	4		
	COMP6176	Human and Computer Interaction	2/2		
	COMP7084	Multimedia Systems	2/1		
	Streaming: Software Engineering				
	COMP6106	Code Reengineering	4		
	COMP6107	Agile Software Development	2		
	COMP6114	Pattern Software Design	2/2		
	Streaming : Intelligent System				
	COMP8108	Natural Language Processing	2/1		
	COMP7066	Expert Systems	2/1		
	COMP7116	Computer Vision	2/2		
	Streaming: Interactive Multimedia				
	COMP7128	Game Design	2		
	COMP7110	Computer Graphic	2/2		
	COMP7094	Multimedia Programming Foundation	2/2		
	Streaming: Database Technology				
	ISYS6172	Database Design	2/1		
	COMP6225	Object-Oriented Database	2/2		
	COMP6064	Geographical Information System	2/1		
	Streaming: Applied Database				
	ISYS7155	Applied Database I	4		
	COMP6064	Geographical Information System	2/1		
	ISYS6172	Database Design	2/1		
	Streaming: Network				
	COMP6113	Network Design	2		
	COMP6120	Network Programming	2/2		
	COMP6132	Linux Operating System	2/2		
	Streaming: Applied Networking				
	CPEN8092	Applied Networking I	4		
COMP6113	Network Design	2			
COMP6120	Network Programming	2/2			

Sem	Code	Course Name	SCU	Total	
5	COMP6144	Web Programming*	2/1	23	
	COMP6062	Compilation Techniques	4		
	COMP6153	Operating System	2/2		
	ENTR6004	Entrepreneurship II	2		
	Elective Course**				
	COMP6099	Advanced Object Oriented Programming	2		
	MOBI6008	Mobile Game Creative Design	2		
	COMP6226	Competitive Programming	2		
	Streaming: Software Engineering				
	COMP6115	Object Oriented Analysis & Design	2/2		
	COMP6122	Framework Layer Architecture	2/2		
	Streaming : Intelligent System				
	COMP7117	Artificial Neural Network	2/2		
	COMP7126	Artificial Intelligence in Games	2/2		
	Streaming: Interactive Multimedia				
	COMP8129	User Experience	2/2		
	COMP7139	Game Programming	4		
	Streaming: Database Technology				
	COMP6119	Database Administration	2/2		
	COMP6140	Data Mining	2/2		
	Streaming: Applied Database				
	ISYS7156	Applied Database II	4		
	ISYS7157	Applied Database III	4		
	Streaming: Network				
	COMP6121	Server Technology	4		
	COMP7142	Popular Network Technology	2/2		
Streaming: Applied Networking					
CPEN8093	Applied Networking II	4			
CPEN8094	Applied Networking III	4			
6	Enrichment Program I		16	16	
7	Enrichment Program II		16	16	
8	COMP8074	Thesis	6	6	
Total Credits 146					

*) *Entrepreneurship Embedded*

**) *Elective Course: students choose one of 3 elective courses with 2 credits*

English Courses University:

-) *For English University Courses I, student with score Binus University English Proficiency Test less than 500 will take English in Focus, and student with score test greater than or equal to 500 will take English for Business Presentation*
-) *For English University Courses II, student with score Binus University English Proficiency Test less than 500 will take English Savvy, and student with score test greater than or equal to 500 will take English for Written Business Communication*

Enrichment Program I & II:

-) *Student will take one of enrichment program tracks (off campus).*

Enrichment Internship Track

Code	Course Name	SCU	Total
Enrichment I			16
COMP6155	Industry Experience I	8	
COMP6156	EES in Industry I	4	
COMP6157	IT Practice in Industry I	4	
Enrichment II			16
Enrichment for students who take track industrial experience in previous semester			
COMP6161	Industry Experience II	8	
COMP6162	EES in Industry II	4	
COMP6163	IT Practice in Industry II	4	
Enrichment for students who take track Study Abroad and Community Development in previous semester			
COMP6158	Industry Experience	8	
COMP6159	EES in Industry	4	
COMP6160	IT Practice in Industry	4	

Enrichment Entrepreneurship Track

Code	Course Name	SCU	Total
Enrichment I			16
ENTR6062	Business Start Up	8	
ENTR6063	Business Model & Validation	2	
ENTR6064	Launching New Venture	2	
ENTR6068	EES in New Business	4	
Enrichment II			16
ENTR6070	Growing a Business	8	
ENTR6071	Lean Startup & Business Plan	2	
ENTR6072	Venture Capital	2	
ENTR6073	EES in Business Experience	4	

Student should pass all of these quality controlled courses as listed below:

No.	Code	Course Name	Minimum Grade
1	CHAR6013	Character Building: Pancasila	B
2	ENTR6004	Entrepreneurship II	C
3	COMP6047	Algorithm and Programming*	C
4	COMP6056	Program Design Methods*	C
5	COMP6048	Data Structures*	C
6	COMP6100	Software Engineering*	C
Stream			
Software Engineering			
7	COMP6107	Agile Software Development	C
8	COMP6115	Object Oriented Analysis & Design	C
Database Technology			
7	ISYS6172	Database Design	C
8	COMP6119	Database Administration	C
Intelligent System			
7	COMP7116	Computer Vision	C
8	COMP7117	Artificial Neural Network	C
Network			
7	COMP6120	Network Programming	C
8	COMP6121	Server Technology	C
Applied Networking			
7	COMP6120	Network Programming	C
8	CPEN8093	Applied Networking II	C
Applied Database			
7	COMP7094	Multimedia Programming Foundation	C
8	COMP8129	User Experience	C
Interactive Multimedia			
7	ISYS6172	Database Design	C
8	ISYS7156	Applied Database II	C

*) Tutorial dan Multipapper